

Appendices: Sweden Green Building Council Response on LEED 2012

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Appendix 1: Sensitive Land Protection

LTp1: Sensitive Land Protection: Case 2 Locations Beyond Previously-Developed Land– Swedish Regulation Equivalencies

a) Prime soils

Swedish regulations

Farmland is land which is used or could be appropriately used for crops or grazing, and also is suitable to plow. For crop production, include those with field conditions appropriate for the cultivation of vegetables, fruit, energy forest and grasslands as part of a rotation (Board of Agriculture 2004a). Also permanently set-aside land, and abandoned farmland should be included, as long as there are no significant barriers to ensure that it can be plowed back up again. Every municipality in Sweden, prepares local plans based on the Planning and Building Act and the Environmental Code that regulates land use and how land referred altered or preserved. Local plan governs that buildings are not being built on unsuitable land with regards to the nature, location and needs. If areas to be developed do not follow the local plans there will be no building permit.

In regards to Agriculture, the Planning and Building Act states:

4 § Agriculture and Forestry of national importance

Agronomic value of agricultural land may only be used for buildings or facilities if it is required to meet an important public interest and this need is not being met in the public interest adequately by other land to be utilized.

b) Flood hazard area

Swedish Definition: 100-year flood (Swedish Agency for Civil Contingencies, msb.se)

MSB defines a 100-year flood as the flood elevation that has 1 % chance of being reached or exceeded each year. There is a 63 percentage chance that the flood will occur one time during the 100-year period and a 40 percentage chance that it will occur twice in the same period. Swedish Agency for Civil Contingencies has developed general flood mapping, showing areas at risk of flooding when water flows reach a certain level. The maps show the distribution areas of 100-year flood and the estimated maximum flow of each watercourse. The purpose of the flood map is to contribute in the planning of local planning.

c) Threatened or endangered habitat

Swedish regulations

The Swedish Environmental Protection Agency has identified the protected natural areas throughout Sweden. These natural areas include national parks, nature reserves, environmental protection areas, animal and plant protection, natural memory, culture reserve, water protection, other legal habitat protection area, landscape protection, forestry legal habitat protection area. The mapping is meant to help municipalities in the local plan development. In addition to the identification of the protected natural areas in Sweden, there's also a Red List, which is an assessment of individual species that are in risk of [extermination](#). The assessment points out the natural habitat areas for these species. The assessment is done by comparing a species' population size, population change, distribution of size, degree of fragmentation, etc. against a set of criteria (thresholds).

d) Wetlands

Swedish Definition: Wetlands (The Swedish Environmental Protection Agency)

Wetland is land where, during most of the year, water is under, at or just above the surface and also vegetation-covered waters. How close to the surface the water is in wetlands varies. In most cases, vegetation can be used to distinguish wetlands from other land. At least 50% of the vegetation should be hydrophilic, i.e. moisture-dependent. An exception is occasionally drained bottoms of lakes, seas and rivers. These are categorized as wetlands, regardless of the lack of vegetation. The Swedish Environmental Protection Agency has identified the protected natural areas throughout Sweden. Sweden's different wetland types are well represented in the protected areas.

e) Water bodies

Swedish regulations

To protect water bodies in Sweden, there are protected beach zones surrounding water bodies. The protected beach zone is regulated by law, and the rules are the same throughout Sweden. The protected beach zone covers both land and water, including the underwater environment. It starts from the shore and extends 328 feet in both directions. The County Board may, if necessary, extend the zone to 984 feet, to meet the purpose of the protected beach zone. Within the protected beach zone it's prohibited to:

- construct new buildings or changing existing ones, so that they can be used for any other purpose.
- dig or otherwise prepare for such constructions.
- perform other facilities or equipment contrary to the protected beach zone objective, that is less accessible as public right or significantly affect the living conditions for plants and animals. Examples of this include marinas, piers, parking lots and golf courses.
- perform other actions that can harm plant and animal life, such as felling trees, digging or fertilizing.

Appendix 2: Site Characterization and Risk Assessment in Sweden

Site characterization and risk assessment in Sweden

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Background

The general purpose of a risk assessment is to give an objective answer to whether a contaminated area constitutes a non-acceptable risk for human health or the environment, and if so, to what extent it shall be remediated.

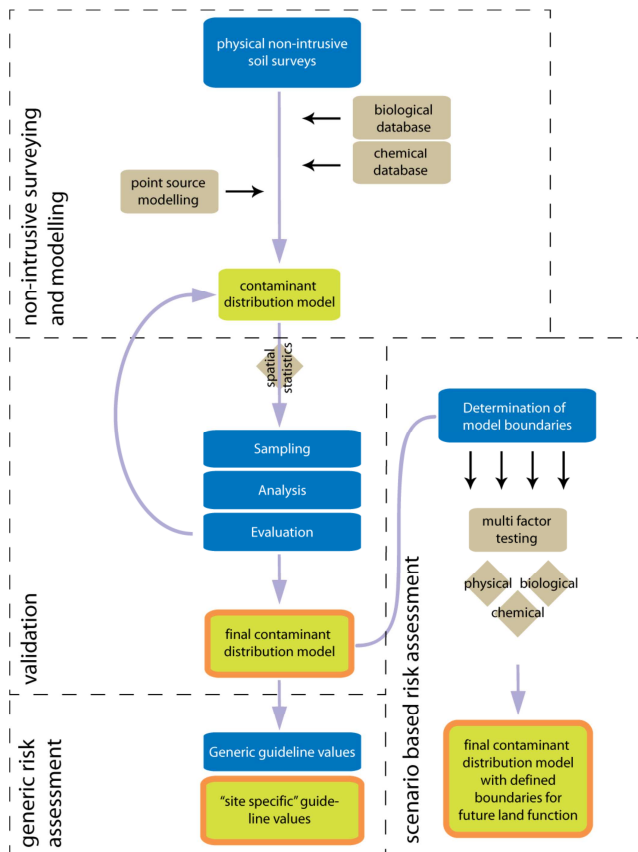
Therefore, the risk assessment is built from two parts:

1. Exposure for humans or the eco system, which in risk phrases would be the consequences if humans or the eco system would be exposed to the contaminant
2. Transport of the contaminant, i.e. the probability for the contaminant to actually reach the humans or the eco system

Multiplied, these factors constitute the site specific risk assessment.

Schematic model

The figure below is a flow chart describing risk assessment that does not only take into account the recent situation but also future land use consequences for the contaminant situation.



Determining objects of special concern

To delineate the risk assessment and the site characterization, one must decide why observations and excavations are being undertaken. For example, it is not necessary to take the same security precautions if you want to build a parking lot on top of a contaminated soil that you will have to if you want to start a kinder garden in the same spot. To be able to determine the scope of the risk assessment, these objects of special concern must be determined initially.

Site characterization

Basic understanding of the geology and hydrology is essential to make a proper site characterization. Without knowledge on the composition of the soil, neither characterizing nor assessment can be done. It is needed both to describe the transport routes and the soil matrix prior to sampling. There is both a physical hindrance for contaminant migration and a chemical hindrance. This hindrance will affect the probability of a contaminant to be sorbed to the matrix i.e. the resistance in the system, which will be of help when the sampling strategy is to be made. From a risk assessment point of view, it is interesting to know geochemical properties both in the contaminated area and “down-stream” since that makes it possible to estimate future transport velocity. Knowing where the point source was situated makes it possible to calculate a preliminary contaminant plume. This is made from the physical survey and the assumed soil chemistry. Combining hydraulic properties with sorption mechanisms will describe chemical and physical hindrance.

These four steps make up the construction of the hypothesis:

1. Possible point sources of contaminants

- a. Inventory of handled chemicals
- b. Inventory of the processes including the chemicals
- c. Analysis of anomalies in the processes above, which suppose a risk (normal modern operation is assumed not to be a risk). There are four types of actions that are identified as sources of risk: 1) Technical dysfunctions, 2) Managing defects, 3) Accidents, 4) Historical mistreatment.

The result of this step is an identification of which contaminants that possibly could be found and where.

2. Conceptual model of contaminant transport

Transport delimiting factors for the chemicals identified in 1a is determined in order to predict the behaviour of the contaminant. The table below describes some of the chemically delimiting factors, which all make up the empirical partition coefficient K_d . In this example, contaminants are very roughly divided into the two categories polar and non-polar compounds. This will be done more precisely with knowledge of the actual chemicals.

Environmental factor	Influence on polar compounds	Influence on non-polar compounds
<i>Surface area</i>	Increased surface area of the sorbent increases the sorption.	Increased surface area of the sorbent increases the sorption.
<i>Mineral surface properties</i>	More charge on the surface increases sorption.	Less charged surface increases sorption. Hydroxyl groups sorb better than oxides.
<i>Solubility</i>	Polar compounds are soluble in water	Low solubility of the compound increases the sorption.
<i>Temperature</i>	Decreased temperature increases sorption because sorption is exothermic.	Relatively independent
<i>pH</i>	A high pH favours sorption of cations while a low pH favours sorption of anions.	Sorption increases if pH reaches pH_{pzc} .
<i>Salinity</i>	High salinity decreases sorption.	Can show an increased sorption at high salinity.
<i>Cosolvents</i>	Not applicable	Presence of cosolvents decreases sorption.
<i>Dissolved organic matter (DOM)</i>	High concentration increases sorption for some species (Cu, Pb Hg among others)	High concentration drastically increases the sorption.
<i>Colloids</i>	Sorbs many cations efficiently, depending on the nature of the colloid, but may not retard them.	Colloids in the form of DOC sorbs HOC:s efficiently, but may not retard them.
<i>Competitive sorption</i>	Compounds of high affinity to soil decreases sorption of others.	Compounds of higher affinity to soil will decrease sorption of others.
<i>Metal oxides</i>	Highly increased sorption to metal oxide colloids by several species	Less important
<i>Redox conditions</i>	Redox sensitive cat ion species decreases sorption at low pE if the ion is reduced.	Not influenced.

The table above only describes the chemical hindrance. Physical properties as conductivity or flow velocity will be of increasing importance as water solubility of the substance increases. This will also be taken into account when creating the conceptual model. The benefits of the conceptual model are two: 1) It helps to points out theoretical transport routes for the contaminants, which is to be included in the hypothesis and 2) It shows which parameters that are to be measured in order to understand the dynamics of contaminant transport, which will increase the cost-efficiency of the risk assessment.

3. Identification of delimiting environmental factors

Using the conceptual model, a site investigation is made to find which of the factors above that applies to the actual site. This will narrow the scope of the sampling.

4. Contaminant distribution model

Merging the conceptual model with the site investigation creates the first hypothesis of the contaminant distribution. The sampling strategy is being made thereafter to verify or discard the hypothesis. A common strategy is to transect the expected hot spots to define the extremes

of the contaminant plume. This transect will be more or less dense depending on the tolerable uncertainty.

Validation of the hypothesis – sampling

A soilwater sample of good quality is very hard to obtain. Or, more correctly, it is hard to know what the sample represents, since variations can be large over small distances. This variation is not a sampling artifact, rather a result from root-induced chemistry, differences in oxygen saturation, moisture content etc. The area is well penetrated in research society although new technique possibly offers new possibilities.

The structures of the primary contaminants that have been deposited at the site will generally be known. In addition, secondary products that have been produced during weathering should be taken into account. The nature of these depends on the redox potential (oxic or anaerobic), and the extent to which the contaminants or their metabolites have become less accessible during aging.

Risk assessment

Difference has to be made between site characterization and risk assessment. The latter describes a probability forecast while the first is a snap shot picture of the recent situation. Today the concepts are mixed up.

Risk assessment is often performed by describing the existing soil system and its contaminants, and from that point extrapolating these conditions to future by using safety margins or guideline values. In a true site specific risk assessment, this approach seems a bit rough. One should better describe for what circumstances the performed assessment is made for. What future land uses/soil functions are considered or what environmental changes are taken into account?

All risk assessments can be divided into two parts; the probability-part and the consequence-part. The latter is normally done on a general level using literature toxicity data. This could impose a problem, since there are large differences between animal- and plant populations at different sites. Variation in-between member states will also be large, since northern countries generally have fewer species than southern countries. This makes the sensitivity of the systems different. The conclusion is that the consequence-part of the risk assessment therefore will be a weakness.

Exposure

Exposure can be assessed by either a theoretical approach or a laboratory approach;

Theoretical

Using LD50 values, PNEC or other toxicity data, the “acceptable limit” of a contaminant can be determined in the area of interest.

Laboratory

An impact assessment of a contaminated site should involve physical, chemical and biological input. An ecotoxicity test for determination of the actual toxicological effect of contaminants in an area is a way to perform a screening of the area. These tests will account for synergies,

chemical complexes or metabolites that affect the bioavailability of the contaminants. It will serve as a verification of the estimations made from chemical analysis, since it weighs all of the factors together and answers the question: is this toxic? A yes- or no-answer to that question will decide whether the project is to do more tests or go on.

The biological input should include the toxicity of contaminants to biota at different trophic levels complemented with an evaluation of their potential for uptake of contaminants. Attention should be directed to both biodegradation and biotransformation.

1. Biota should include bacteria isolated from the site and assays for toxicity of the contaminants that are present, or predicted to be present. In addition to degradation, they may carry out transformation to metabolites that may be both persistent and toxic to other biota.
2. Worms should be included since their mechanism for uptake involves direct soil ingestion. They can at the same time be used to evaluate toxicity in appropriate assays together with uptake.
3. Higher plants are important since they represent a segment of the food chain for higher biota and have attracted attention for remediation. Toxicity can be evaluated using seed germination and growth and uptake in the plants. In addition, this should take into account the potential role of plant exudates in supporting the growth of bacteria in the neighbourhood of the roots in promoting biodegradation. For all of these organisms, it is important to take into account not only the loss of the original contaminants but also the formation of metabolites that may be stable, and have adverse effects on other biota in the soil.

Transportation

Also transportation can be assessed by either a theoretical approach or a laboratory approach:

Theoretical

The retardation coefficient of the soil is calculated as a product of both the chemical hindrance and the physical ditto, i.e. the K_d coefficient of the soil and the hydraulic properties.

Laboratory

In laboratory this is examined by doing leaching experiments which should be done but in a way that makes use of the fact that situations can be simulated (for example controlled redox changes) to extrapolate a forecast. This is one example of environmental properties that can change over time that should be a part of an assessment that aims for a sustainable perspective.

- First, environmental factors that are of concern should be identified. From that point, the analytical tools to perform the simulations have to be found.
- Second, the possibility of combining two or more factors in order to reduce the number of test should be investigated.
- At last, a guidance tool that helps the consultant to choose in-between different tests, from the chosen conditions.

Appendix 3: Stockholm Water Guidelines

Stockholm vattens riktlinjer för länshållningsvatten samt spräng- och borrhvatten från byggarbetsplatser

Länshållningsvatten kan efter lokal rening och beroende på föroreningsinnehåll antingen infiltreras i mark, avledas till en recipient eller till reningsverk.

Entreprenören skall upprätta och lämna in en beskrivning av miljöpåverkan från det avloppsvatten som ska avledas från platsen. Beskrivningen ska visa tidsperiod, vattenmängd både momentant och totalt, eventuella föroreningar i mark eller grundvatten och i det vatten som ska avledas (bl.a. metaller och organiska ämnen), påverkan på mottagande avloppsreningsverk eller vattendrag m.m. Stockholm Vatten gör sedan en bedömning av vart vattnet bör avledas.

Vatten direkt till recipient eller markområde

Vatten som innehåller låga föroreningshalter bör inte belasta avloppsreningsverken utan behandlas lokalt (renas t.ex. i slam- och oljeavskiljare) och avledas till mark- eller vattenområde. Vid utsläpp direkt till mark eller vattenområde skall Miljöförvaltningen alltid rådfrågas.

Vatten till avloppsreningsverk

Vatten från sprängning och borrhning kan innehålla höga kvävehalter och bör därför behandlas i reningsverk, dock under förutsättning att andra förekommande föroreningar inte stör reningsprocesserna i avloppsreningsverken eller försämrar slamkvaliteten. När kvävehalten överstiger 45 mg/l debiterar Stockholm Vatten en särskild reningsavgift (industriavloppstaxa), för närvarande 26,27 kr/kg kväve exklusive moms.

För att sänka halten av suspenderade ämnen behöver sedimentering av vatten ske. En effektiv slamavskiljning (>12 tim) har också visat sig medföra en markant sänkning av metallhalterna i vatten.

Kombinerat ledningsnät

Ca 50 % av Stockholms avloppsledningssystem består av kombinerade ledningar där både spill- och dagvattnet leds till avloppsreningsverk. I sådana fall kan hänsyn tas till ekonomiska och praktiska möjligheter att leda vatten till recipient eller lokalt markområde.

Utjämning av flödet

Om kapaciteten i ledningsnätet och/eller pumpstationer är otillräcklig ska vattnet kunna magasineras för att sedan avledas när flödet i ledningsnätet är litet.

Var god vänd!

Stockholm Vattens krav på vatten som tillförs ledningsnätet

Avloppsvattnet skall behandlas i slamavskiljare och oljeavskiljare. Flödet skall anges. Omfattningen på provtagningen anpassas till omfattningen av det aktuella arbetet och avgörs i samråd med Stockholm Vatten. För stora arbeten tas flödesproportionella prov på utgående vatten från behandlingsanläggningen. Avloppsvattnets kvalitet skall kontrolleras med avseende på pH, konduktivitet (ledningsförmåga), suspenderad substans (susp), totalkväve, metaller (lämpligen s.k. ICP-analys) och oljeindex. Analysresultaten skall skickas till Stockholm Vatten för bedömning.

- Leds vattnet till reningsverk ska oljeavskiljare dimensioneras så att oljehalten i avloppsvattnet från anläggningen inte överskrider 50 mg/l mätt som oljeindex. Leds vattnet direkt till recipient ska oljeavskiljaren klara 5 mg/l.
- Slamavskiljningen skall vara så effektiv att halten suspenderad substans i vattnet från anläggningen inte överstiger 300 mg/l.
- pH-värdet bör ligga inom intervallet 6,5-11.
- Kväve ska mätas en gång per vecka när sprängningsarbeten pågår och bör ligga under 45 mg/l.
- Metallhalterna bedöms från fall till fall. Bedömningen utgår från varningsvärdena i Stockholm Vattens råd och regler "Utsläpp av avloppsvatten från yrkesmässig verksamhet" samt Dagvattenstrategi för Stockholms stad (se www.stockholmvatten.se).
- När schaktning pågår i PAH-förorenad mark ska PAH-16 analyseras en gång per vecka.

Provtagning

Provtagning ska genomföras flödesproportionellt med automatisk provtagare. Om detta inte är möjligt kan provtagningen ske tidsstyrt efter samråd med Stockholm Vatten. Prov ska tas på utgående behandlat/sedimenterat vatten under fem arbetsdagar som därefter slås samman till ett veckosamlingsprov. Analyserna ska göras på icke filtrerade prover. Övriga önskade föroreningar ska analyseras då behov föreligger och enligt överenskommelse med Stockholm Vatten.

Redovisning till Stockholm Vatten ska inledningsvis ske varje vecka. Om analyserna stadigvarande ligger under varningsvärdena kan provtagningen glesas ut efter samråd med Stockholm Vatten.

Provtagning och analys ska genomföras av behörig provtagare och ackrediterat laboratorium.

Vid små och/eller extra känsliga recipienter kan andra riktvärden gälla.

Har ni frågor om föroreningar och provtagning så kontakta miljöingenjör på Stockholm Vatten. Frågor om anslutningspunkt m.m. besvaras av Ledningsnät/Anslutning och recipientfrågor av Ledningsnät/Utredning. Stockholm Vattens telefon är 08 522 120 00.

Obs!

Vid utsläpp direkt till mark eller recipient kan Miljöförvaltningen ställa andra krav än vad som anges ovan.

Efter byggskedet ska dag- och dräneringsvatten ledas till dagvattennätet.

Appendix 4: Green Space Factor

Grönytefaktor

Agneta Persson, mässplanechef BO01

Bostadsgårdarna på Bo01 är förhållandevis små och delvis skuggiga. Ett flertal är dessutom byggda på bjälklag, det vill säga med garage eller källarvåning under. Många byggherrar planerade för bil- och cykelparkeringar, plats för sopsug etc. Hur skulle dessa bostadsgårdar kunna locka till vistelse, hur skulle de kunna bli inbjudande gröna och frodiga? Tanken föddes att, för första gången i Sverige, införa en *Grönytefaktor*, ett relationstal för att mäta fördelningen mellan växtlighet och dagvattenhantering i förhållande till bebyggd kvadratmeteryta. **Grönytefaktorn har utformats så att den är ett redskap för att garantera så rik växtlighet som möjligt även på små ytor.** Faktorn är föreskriven i Kvalitetsprogrammet för bostadsgårdarna. Inspirationen kommer från bland annat Berlin där liknande metoder använts sedan länge, men huvudsakligen för att fördröja dagvattnet.

På Bo01 mäts Grönytefaktorn som ett genomsnittligt värde för hela tomtens yta. De olika delytorna inom tomten får ett värde mellan 0,0 och 1,0 beroende på vilka förutsättningar de erbjuder växtligheten, men också den lokala dagvattenhanteringen. Grönytefaktorn redovisas i bygglovshandlingarna och granskas av stadens bygglovsavdelning. Det genomsnittliga värdet ska uppgå till minst 0,5. Möjligheterna att uppnå den fastställda faktorn är många. Det finns 14 delfaktorer att välja på, där *Grönska på mark* och *Vattenytor i dammar, bäckar, diken* ger det högsta värdet.

Grönytefaktor för Bo01

- **Delfaktorer för grönska**

1,0 Grönska på marken

Terrassen skall vara anpassad till biotopen. Den får ej skära av eller försvåra kontakten mellan växtbädden och underliggande jord på ett sätt som gör att växtlighetens eller biotopens långsiktiga utveckling äventyras. Växtbädden och terrassen skall ge förutsättningar för en naturlig infiltration och perkolation till grundvattnet. Om växtbäddar och terrass inte utformas på ett acceptabelt sätt, skall ytan räknas lika som grönska på bjälklag.

0,7 Grönska på väggar

Kläng- och klätterväxter med eller utan stöd av spaljéer, linor etc. Ytan räknas för den del av väggen upp till högst 10 m höjd, som inom loppet av 5 år kan förväntas bli övervuxen. En klängande växt som kräver stöd kan bara täcka den yta där det finns stöd monterat. En självklättrande växt beräknas täcka alla ytor inom den bredd som de planterade plantorna kan förväntas täcka, exklusive fönsterytor. Redovisas med skiss av fasaden och förväntad täckning efter 5 år.

0,8 Gröna tak

Växtbäddar med torktålig växtlighet som används som ytskikt på tak istället för traditionella ytskikt.

1,0 Vattenytor i dammar, bäckar, diken etc.

Avser vattenytor som finns under minst 6 månader av året.

0,6 Växtbädd på bjälklag

< 800 mm djup

0,8 Växtbädd på bjälklag

> 800 mm djup

Grönska på bjälklag, dvs. på taket till garage och parkeringshus, terrasser på hus, balkonger, etc. Till växtbäddsdjupet räknas endast det som är möjligt för växternas rötter att tränga in i och som är biologiskt aktivt.

0,4 Träd med stamomfång 35 cm eller större

Faktorn räknas för en yta av högst 25 m² planteringsyta/träd.

0,2 Solitärbuskar, flerstammiga träd högre än 3 m

Faktorn räknas för en yta av högst 5 m² planteringsyta/buske eller träd.

0,2 Kläng- och klätterväxter högre än 2 m

Faktorn räknas för en väggyta med 2 m bredd/planta gånger den höjd som plantan når efter plantering och uppbindning.

• Delfaktorer för hårdgjorda ytor och för lokal dagvattenhantering

0,0 Täta ytor

Takytor, asfalt och betong som inte har någon form av växtbädd eller annan möjlighet att utveckla biotoper för växtlighet och som inte släpper igenom dagvatten.

0,2 Hårdgjorda ytor med fogar

Traditionellt lagda platt- och stenytor, som betongplattor, gatsten och klinker, med normala fogar fogade med sand som ger en viss genomsläpplighet för dagvattnet.

0,4 Halvöppna till öppna hårdgjorda ytor

Gräsarmerad betong- eller natursten, öppen asfalt, grus, singel, sand och andra ytor med hög genomsläpplighet för dagvatten.

0,1 Avvattning av täta ytor till omgivande grönska på marken. Täta ytor (faktor 0,0) och hårdgjorda ytor med fogar (faktor 0,2) som inte har några brunnar och som höjdsätts så att de avvattnas till intilliggande ytor med grönska på marken (faktor 1,0) ger en tilläggfaktor. Faktorn beräknas för den yta som avvattnas, dock högst det antal m² som vegetationsytan omfattar.

0,2 Uppsamling och fördröjning av dagvatten. En tilläggfaktor ges för dagvatten som samlas upp i damm eller andra magasin. Vattnet skall kunna hämtas upp och användas på gården eller i husen. Tilläggsfaktorn gäller täta ytor (faktor 0,0) och hårdgjorda ytor med fogar (faktor 0,2) och under förutsättning att magasinet/dammen rymmer minst 20 l/m² avvattnad yta.

Appendix 5: Environmental Choice Electricity



Naturskyddsföreningen

Ge oss kraft
att förändra
Pg.90 1909-2

Good Environmental
Choice criteria

Electricity

Version 2009:1

Bra Miljöval

Good Environmental Choice. The world's toughest eco-labelling.

The Swedish Society for Nature Conservation (SSNC) is a non-profit organisation that is independent of political and religious interests. Care for the environment and people's health are our driving forces. It is partially due to us that seals, sea-eagles and peregrine falcons are no longer endangered species in Sweden. We promote biological diversity, and strive to prevent climate change, acidification, over fertilization, the spread of dangerous chemicals and much more.

But protecting nature through establishing nature reserves or stopping individual polluters is not enough. The total impact on the environment has to be reduced. Companies that environmentally adapt their production and their products are very important in this work.

Good Environmental Choice is the SSNC's own environmental label, which it uses as a tool to advance the development of a sustainable society. Good Environmental Choice places high environmental requirements on the products and services that it approves for labelling.

This has contributed to hundreds of products being reconstituted in order to make them environmentally friendly. The labelling system has resulted in tangible changes. For example, the Good Environmental Choice label has succeeded in almost totally removing the environmentally-hazardous surfactant LAS from Swedish laundry detergents.

Another example is that electricity labelled with Good Environmental Choice has placed demands on water flow through hydroelectric power plants, and, through this, has increased the biological life in the affected rivers. In the case of biofuel power plants, there is a requirement to return the ash to nature in order to complete the biological cycle.

Good Environmental Choice labelling is part of the SSNC's "Green Consumerism" initiative. Green Consumerism is a network of active members who implement initiatives including an annual Green Week. Thanks to this campaign, the range of products in most grocery stores is becoming increasingly environmentally friendly. Consumers take the Good Environmental Choice labelling as a credible indicator. And it definitely gives the licence holder competitive advantages.

Today there are criteria for Good Environmental Choice for the following products and services:

- Heat energy
- Electricity
- Goods transport
- Passenger transport
- Grocery stores
- Paper
- Textiles
- Chemical products



Bra Miljöval

Read more about Good Environmental Choice at www.bramiljoval.se

The criteria can be ordered via e-mail:

gbg@naturskyddsforeningen.se or downloaded from www.bramiljoval.se

For further information contact the SSNC, Box 7005, SE-401 31 Göteborg, Sweden,
tel: +46 (0)31-711 64 50, fax: +46 (0)31-711 64 50, e-mail: gbg@naturskyddsforeningen.se

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For further information on Good Environmental Choice labelling and the application procedure visit website: www.bramiljoval.se or contact the SSNC, Box 70005, SE-402 31 Göteborg, tel +46 (0)31-711 64 50, fax: +46 (0)31-711 64 30, e-mail: gbg@naturskyddsforeningen.se

Introduction

These are the environmental criteria for Electricity 2009. With these new criteria, the Swedish Society for Nature Conservation (SSNC) stipulates how electricity shall be generated in order for it to be approved for Good Environmental Choice eco-labelling. Good Environmental Choice is one of the tools used by the SSNC to advance the development of a sustainable energy system.

Simply put, environmental impact caused by private consumers are linked to the need for shelter (housing), the use of transportation and the need for food. Within industry and the public sector, the consumption of electricity can constitute a significant part of the environmental impact they cause. The electricity that is supplied can be generated in different ways, and therefore it is important to develop sustainable electricity production. Knowledge of our influence on the climate has resulted in consumers turning to the SSNC in search of concrete guidance on how to reduce the environmental impact caused by electricity production. Selecting electricity labelled with Good Environmental Choice helps to reduce environmental impact as well as rectify the damage that renewable energy production causes. At the same time, we have to reduce our need for electricity through improving insulation, checking out heating systems and using housing, commercial premises and office space more effectively.

The criteria for Good Environmental Choice electricity labelling have been ratified by the SSNC secretary-general. The SSNC would like to thank all the representatives from regional groups, companies, county associations and interest groups as well as researches for their help in the work of developing these criteria.

Eva Eiderström

Head of Department of Eco-labelling

Goals

- Prevent new electricity being based on unsustainable means of production, and promote electricity based on sustainable means of production
- Increase investment in long term sustainable sources of production
- Reduce electricity consumption
- Reduce the negative effects of renewable electricity on biological diversity.

Criteria scope

Electricity labelled with Good Environmental Choice comprises two parts. The basic criteria entail specific requirements for each type of production, stipulating those which are eligible for Good Environmental Choice labelling. The additionality requirements result in direct benefit to the environment for each sold volume of electricity that is eco-labelled.

All renewable sources for electricity can be labelled Good Environmental Choice if the production of them meets the set criteria presented here. This document states the requirements for the complete chain: fuel, production and processing of residue.

To obtain a licence to use the Good Environmental Choice eco-label for a particular form of electricity, both the basic criteria and the additionality criteria must be met. The amount of additionality the electricity can be awarded depends on the level the production reaches in the basic criteria.

Definitions

Additionality	The measurable or quantifiable environmental benefit gained in connection with use of electricity labelled with Good Environmental Choice that exceeds the basic level defined through legislation, market conditions and support systems. In some cases additionality arises in the basic criteria but can also only concern an allocation of energy from one consumer to another.
Renewable energy	Renewable refers to a source of energy that in principle cannot run out, irrespective of whether or not energy is taken from it. The term renewable must pertain to a specific time span and geographical area. A reasonable period is that of a person's life, about 100 years. This implies that the energy source must be regenerated within one generation.
Basic criteria	The criteria which define the types of energy that can be Good Environmental Choice labelled.
Eco-labelled energy	This refers to renewable energy, which means that the included sources of production meet the basic environmental criteria plus additionality.
Production unit	The unit in which the electricity is produced. The production unit can comprise a complete plant or part of a plant, for example, an incinerator in a combined power and heating plant with several incinerators.

1 General basic criteria

- 1.1 An electricity product eligible for eco-labelling shall be produced using renewable sources, for example, hydroelectric power, wind power, solar power, wave and tidal power, combustion of biomass or biogas.
- 1.2 For a product to be eligible for Good Environmental Choice labelling, it must obtain 25 points plus 5 points for improved energy effectiveness as defined in the appendix Additionality evaluation. Each point equates to 100 SEK/GWh.
- 1.3 The eco-labelled electricity may include up to 10% non-renewable energy during the whole life cycle. This includes energy used for waste heat utilization, transportation and refinement of fuel, process energy at the plant, key production during high consumption periods, as well as energy used for the transportation of residual products. Energy balance through balance services or the equivalent is not considered as process energy. If generation of electricity and heat are parallel products, the energy quantities shall be allocated, in the first place, according to the principles for physical allocation and secondly according to financial allocation methods.
- 1.4 At the end of the calendar year, the amount of Good Environmental Choice labelled electricity sold must correspond to the amount of electricity produced according to the valid criteria for Good Environmental Choice.
- 1.5 The electricity that is supplied with the Good Environmental Choice label does not guarantee the source for any other supply of electricity. If source guarantees have been issued for the electricity in question, these shall append the delivery of the eco-labelled electricity.
- 1.6 Financial agreements, source guarantees according to EECS standard and RECS-certificates can be used to verify the electricity that shall be Good Environmental Choice labelled. The physical electricity from the quantity of energy in question shall be supplied to the Nordic electricity grid during the prevalent calendar year.
- 1.7 Those wishing to use the Good Environmental Choice label or refer to it must satisfy all the requirements for electricity labelled with Good Environmental Choice and enter into a licensing agreement with the SSNC.
- 1.8 The production units generating the electricity that shall be included in the licensing agreement must be situated in Sweden, Norway, Denmark or Finland. Production units in Finland must fulfil the criteria for Finnish eco-labelling, Norppa. All the production units must be approved by the SSNC.
- 1.9 Electricity labelled with Good Environmental Choice shall be accompanied by a fund allocation for the improvement of energy effectiveness corresponding to at least 500 SEK/GWh. This allocation shall be used for improvement projects in accordance with appendix Improving energy effectiveness and be approved by the SSNC. The allocations can also be placed in the SSNC central fund. The SSNC then carries out energy effectiveness improvement measures according to the appendix Improving energy effectiveness.
- 1.10 Produced electricity for products that are Good Environmental Choice labelled must have been produced in a plant with an environmental management system in accordance with ISO 14000, EMAS or the equivalent. The company management shall have adopted an environmental policy through which the company commits itself to improve its environmental efforts.

Justification of requirements

[1.3] Electricity production using large quantities of fossil fuel for production, transportation, use and offsetting is not sustainable. Consequently, the effectiveness of the production affects the requirements for the maximum amount of non-renewable energy. Since the requirement is based on a 100 year perspective, necessary operations outside the plant are also included.

[1.4] Checks to verify that the amount of sold eco-labelled heat energy really has been produced at the plant are crucial to the credibility of the eco-labelling. An inspection is carried out by an authorised accountant in connection with the annual audit.

2 Basic criteria for hydroelectric power

- 2.1 Only electricity from hydroelectric power plants built before January 1 1996 can be approved for Good Environmental Choice labelling.
- 2.2 Effectiveness improvements in hydroelectric plants can be made within the water-rights court ruling if changes do not increase the net environmental impact. Measures taken after January 1 1996 must be approved in the licensing agreement with the SSNC.
This applies irrespective of the date of the water-rights court ruling.
- 2.3 Hydroelectric power plants that shall be included in a licence for Good Environmental Choice labelled electricity must have a minimum withdrawal past the plant corresponding to mean low discharge (MLQ) or, if the licence stipulates that damming or lowering levels are restricted, corresponds to the least catchment volume minus evaporation. Mean low discharge shall be taken as the average of the lowest low-water discharge for each year over a period of at least ten years.
- 2.4 Minimum withdrawal shall initially be released to the original river bed and secondly to a watercourse giving the maximum positive effect on the environment. The minimum withdrawal shall pass by the plant. In cases with no net positive environmental effect or where passing the plant, for technical reasons, is not possible, minimum withdrawal can pass through the plant.

Criteria level I

- 2.5 Hydroelectric power that meets criteria level I for Good Environmental Choice labelled electricity shall provide a yearly allocation to an environmental fund corresponding to 1,500 SEK/GWh of hydroelectric power in the sold eco-labelled electricity.
- 2.6 The environmental fund allocation can be used for projects that are carried out in the licence holder's own operations or be placed in the SSNC's central environmental fund. Examples of projects that can be financed through the environmental fund are available in appendix Environmental fund projects. Projects that are carried out by the licence holder shall not include measures required to obtain permits or meet legislation.
- 2.7 All projects financed through the environmental fund allocation must be approved by the SSNC.
- 2.8 Use of the environmental fund need not be related to the plants producing the Good Environmental Choice electricity. Projects that can be financed through the environmental fund must, however, be connected to the plants producing the electricity the licence holder supplies to customers through other sales.

- 2.9 The financing of research through universities aimed at increasing knowledge of the environmental effect of hydroelectric plants, or measures that reduce their environmental impact, can be approved even if it is not related to the plants producing electricity that is not eco-labelled and which is supplied to customers by the licence holder.

Criteria level II

- 2.10 In order for hydroelectric power to meet criteria level II the hydropower plant must go through an environmental audit in accordance with SSNC guidelines. The environmental audit shall report excessive environmental impact with a special focus on biological diversity, prioritised measures and any possible restrictions on carrying out the measures.

On the basis of the measures proposed by the audit and on approval by the SSNC, the measures shall be applied at the applicable hydroelectric plant corresponding to 2,500 SEK/GWh of hydroelectric power in the sold eco-labelled electricity.

Justification of requirements

[[2.3] The SSNC considers improvements in effectiveness according to ordinance (2003:120), paragraph 6 concerning electricity certificates, which entail an increase in the average used water flow through the plant and reduced friction losses in waterways, in most cases, to result in a net increase in environmental impact and can therefore not be approved.

3 Electricity generation using biofuel

Criteria level I

- 3.1 Biofuel shall not originate from gene-modified organisms (GMO).
- 3.2 Combustion installations shall have a system for monitoring the source of all biofuel used in the production of the electricity that is to be Good Environmental Choice labelled.
- 3.3 The fuel for the production of Good Environmental Choice labelled electricity shall meet the basic criteria applicable to the fuel (Section 4).
- 3.4 The biofuel shall not be burned together with other fuel if this results in the ashes not meeting the Swedish National Board of Forestry guidelines for ash recycling. Ash from the combustion of biofuel shall be separated and kept separate from other ash. According to criteria level I, the ash need not be returned to its source location, if this is not stipulated in the official permit, but the SSNC recommends it.
- 3.5 Biofuel from countries outside the EU shall meet the requirements of the Forest Stewardship Council (FSC) or an equivalent third-party label.

Fuel originating from biomass is considered as biofuel. The fuel can have passed through a chemical or biological process or refinement, or have been used in some other way.

Criteria level II

- 3.6 The production shall fulfil the same requirements as given in criteria level I.
- 3.7 Ash from incinerators shall be returned to its source soil type in accordance with the Swedish National Board of Forestry guidelines or the equivalent in the respective countries.

Justification of requirements

[3.1] The SSNC considers the risks surrounding gene-modified organisms, GMOs, to be insufficiently well established. For more information on the SSNC views on GMOs, visit www.naturskyddsforeningen.se.

[3.2] According to the SSNC, one of the key questions concerning the production of biofuel is the verification of its origins. By applying a traceability system, requirements for forest conservation, silviculture and felling can be established and adhered to. A traceability system can also prevent the use of biofuel from illegal felling or from felling that violates human rights.

In the first place, the traceability shall be based on the delivery contract for the fuel. As second choice, financial agreements regarding the fuel's origins can be approved.

[3.5] That the extraction of biofuel does not put valuable forest at risk is one of the conditions necessary for the SSNC to consider biofuel as a sustainable fuel. FSC requirements ensure this protection.

4 Basic criteria for biofuel

Fuel from the forest industry

- 4.1 Wood fuel, including biomass from thinning and residual wood in connection with felling, shall either come from FSC labelled forestry or forestry that is run according to principles and measures aimed at sustainable forestry.
- 4.2 Fuel, comprising mainly of pine needles, leaves and root pulp can not be included in Good Environmental Choice labelled fuel, but shall, as much as possible, be left in the forest. This does not apply to needles and leaves that come with branches and tree tops.
- 4.3 Wood fuel from illegal felling or from areas with high conservation values is not eligible.
- 4.4 Wood fuel from forestry with a rotation period of less than ten years, such as that from willow plantations, shall not be grown on land converted from grazing or meadow land with high nature values.

Wood fuel from wood raw material that has not undergone chemical processing is considered as biofuel. Wood fuel constitutes all biofuel where trees or parts of trees are the starting material, for example, bark, needles, leaves, firewood, as well as fuel raw material from the forest and wood industries such as sawdust, woodchips and end cuts. Fuel raw material can have been used for other purposes, coming from, for example, demolition or packaging. Fuel from waste paper and return lye is not considered as wood fuel.

The definition adheres to the SSNC standard for solid biofuel and peat (SS 187106). Material with biological origins which has not or which has only minimally been processed chemically or biologically, is considered as biomass.

Justification of requirements

[4.4] The SSNC considers biofuel from agriculture as a good complement to biofuel from the forest. Production must, however, be carried out in an ecologically sustainable manner, using as little inorganic fertilizer and pesticide as possible.

Definition of forest with high conservation value

High conservation value forest has one or more of the following characteristics:

a) forest that is of global, regional or national significance:

- concentrations of biological diversity (for example, endemic species, endangered species, sanctuaries); and/or
- province scale forests, which form part of the forestry unit, or in which the forestry unit is included, where healthy populations of the majority of endemic species exist through natural propagation and in natural quantities.

b) forests that are situated within, or which themselves accommodate ecosystems that are rare, endangered or under threat of extinction.

c) forests that maintain basic natural functions in critical situations (for example, protection for drainage basins or for erosion control).

d) forests that are crucial to the basic needs of the local community (for example, income and health) and/or crucial to the traditional cultural distinction of the local community (areas of cultural, ecological, economical or religious significance which are an inherent part of life in such communities).

In Swedish forests with high conservation value are, among other things, marked by the following:

- forest areas of national interest and/or established national interest, with a concentration of key biotopes and/or facilities for listed species outside the key biotopes.
- forest close to mountainous zones and situated above nature conservation height limits (SSNC 1988, ISBN 91- 558-5201-7).
- Conservation forest according to paragraph 15 SVL and forest within conservation areas for public water supply.

Biofuel from agriculture

- 4.5 Biofuel from agriculture shall not originate from land that has been converted from grazing or meadow land with high nature values.
- 4.6 The extraction of agriculturally produced biofuel shall not reduce nutrition levels nor reduce the humus content in the soil in the long term.
- 4.7 Methane gas (biogas) collected from manure can qualify as biofuel.

Fuel from plantations and market gardens.

- 4.8 Solid biofuel from plantations and gardens, such as fruit, nuts, vegetables and residual products as well as fluid vegetable oils shall be grown so as not to cause an increase in ground erosion or have a negative effect in terms of local ecological, economical and socially sustainable development.
- 4.9 Fluid biofuels, including bio-oils, may not contain virgin palm oil or other similar fuels that entail significant, negative socio-economic and environmental consequences. The bio-oil shall not contain by-products, such as Palm fatty acid distillate (PFAD), which comes from the distillation process in palm oil production. By-products from the production of primary products, for example, in the grocery industry, where palm oil is a primary product, shall in the first place be further processed and as second choice used for energy production.

Virgin palm oil is considered as oil taken from the fruit of the oil palm and which has not been used in another product.

Fuel from industry

- 4.10 By-products from sawmills such as sawdust, woodchips and bark can be considered as biofuel. It must be possible to trace the fuel back to the sawmill. If the sawdust, chips and bark come directly from forestry, this is not considered as fuel from industry and must then meet the requirements for fuel from forestry.
- 4.11 Fibre-rich by-products from paper and paper pulp production such as black lye and fibre sludge can be considered as biofuel providing the biomass content exceeds 80%.

Biofuel from waste

- 4.12 Unsorted waste cannot be used as fuel for the production of Good Environmental Choice labelled electricity.
- 4.13 Sorted refuse that is 90% organic material can be included as fuel providing the biomass, for environmental reasons, cannot be returned to the forest or agriculture, or used in further production.
- 4.14 Return wood (RT-wood chips) included as biofuel shall not be painted, chemically processed, or contain plastic or metal that would decrease the quality of the ash.
- 4.15 Landfill gas is not approved as fuel for producing Good Environmental Choice labelled electricity. According to the EU waste directive, landfill gas shall be collected for other reasons.
- 4.16 Biogas from the decomposition of waste can be used as biogas fuel providing methane leakage or the use of fossil energy is considered as process energy in the criterion 1.2.

Justification of requirements

[4.12] Waste shall, in the first place, be recycled. Combustion with energy recovery shall be the second choice application.

Biogas is gas that is formed when organic material such as manure, sludge from municipal or industrial sewage works, household waste and waste from foodstuffs production, restaurants and shops is decomposed by methane producing bacteria under oxygen-free conditions.

The definition adheres to the definition in ordinance (2003:120) concerning electricity certification.

5 Basic requirements for wind power

- 5.1 Wind power shall in Good Environmental Choice labelled electricity always be considered as criteria level II.
- 5.2 Wind power plants shall not be placed in areas that are legally protected in the respective countries or by international conventions, group 1 according to appendix Wind power, or other areas that the SSNC points out as worthy of conservation in terms of the Environment Act consideration regulations or corresponding legislation. Areas that the SSNC today considers worthy of conservation are given in group 2, appendix Wind power.
- 5.3 Wind power plant companies shall hold and follow written directions for self-supervision according to Ordinance (1998:901) on the exercise of self-supervision or the equivalent in respective countries. Self-supervision shall include routine and systematic assessment of operational risks from health and environmental perspectives with a special focus on effects on flora and fauna. A plan for self-supervision shall be included in the application.

Wind power – justification and working method

The building of new wind power plants is on the increase, something that is primarily positive, but which at the same time can impose a threat to areas with high nature values. Such areas can, for example, comprise forested land above felling height where listed species can thrive undisturbed, and areas closest to the breeding grounds of endangered birds of prey. The SSNC follow the building permit processes and forward opinions and stipulations. SSNC is of the opinion that new wind power plants shall not be built where they can cause damage to documented high nature values. Should it nevertheless occur that permission is granted to build a plant in such an area, the SSNC shall investigate whether this is acceptable within the framework for Good Environmental Choice labelling. Consideration with regard to the construction work and the self-supervision process will then be crucial aspects.

The appendix Wind power gives two groups of areas where existing wind power plants will not be eligible for a Good Environmental Choice licence. If there is sufficient scientifically based information showing that the plant in question within a group 2 area, appendix Wind power, has marginal negative effect on the environment, the SSNC could, nevertheless, grant a licence.

6 Basic requirements for solar power and other renewable electricity

- 6.1 Solar power and wave power shall in electricity labelled Good Environmental Choice always be considered as criteria level II. Other renewable electricity production that is not taken up in this criterion can be granted environmental electricity supply labelling subsequent to special testing by the SSNC.
- 6.2 In order for solar power plant electricity supplies to be approved for Good Environmental Choice labelling, a plan for residue processing must be established and applied.

Appendix 1 Additionality evaluation

Background

In order for a specific unit of electricity to be Good Environmental Choice labelled, the product must meet basic requirements plus requirements for additionality. If the production of electricity meets requirement level I, the additionality must be more than if the electricity meets criteria level II. If the electricity in total volume meets criteria level II, no additionality is required for it to be granted Good Environmental Choice labelling. Each additionality point equates to 100 SEK/GWh.

Additionality can be gained by three means: Investment fund, energy effectiveness improvement or environmental fund allocation according to the appendix for this criterion. The licence holder can apply one or several of these to obtain the necessary additionality points.

Estimation of the degree of additionality

In order for a product to be Good Environmental Choice labelled, it must obtain 30 points. The table below shows the requirement levels and the points awarded for them. The basic requirement is 5 points for energy efficiency.

Criteria level	Hydroelectric power	Incineration plant with biofuel	Wind power	Solar power, wave power and other renewable energy
I	15	15		
II	25	25	25	25
Energy efficiency	5	5	5	5

The number of points for a particular source of production shall be multiplied by the proportion of the product produced by that source.

Points = points for the requirement level in question * (volume energy in the product / product's total volume)

By subtracting the sum of all the included energy sources from 30 points, you obtain the number of points that need to be added through additionality to reach the criteria level.

Example:

The product is 20 GWh, of which 2 GWh is produced by wind power, 8 GWh by hydroelectric power at level I and 10 GWh by hydroelectric power at level II.

Points	Volume	Points
Wind power	2 GWh	$2/20 \times 25 = 2,5$
Hydroelectric power, level I	8 GWh	$8/20 \times 15 = 6$
Hydroelectric power, level II	10 GWh	$10/20 \times 25 = 12,5$
Total	20 GWh	= 21
Criteria level		= 30
Additionality requirement		= $30 - 21 = 9$

In the case above 9 additionality points will have to be created, this equate to 900 SEK/GWh. Of this, 5 points shall be allocated to the energy efficiency fund and the remaining 4 points can be allocated, as preferred, between the three ways of creating additionality. Note that allocation to the environmental fund is part of the basic requirement for hydroelectric power criteria levels I and II, and is handled separate from this allocation.

A tool for estimating additionality requirements based on sales volumes and criteria levels can be downloaded from www.bramiljoval.se. Examples of additionality estimations are given on the website.

Appendix 2 Wind power

2009-01-01

Definition of Group 1

Wind power that is included in a Good Environmental Choice licence shall not be located in an area that is protected through legislation in the respective countries or through international conventions, Group 1.

Areas in Group 1 are:

- National parks
- Nature reserves
- Marine reserves
- Ramsar areas
- Natura 2000-areas
- Bird and seal sanctuaries

Definition of Group 2

Here are the primary bird migration paths and resting places in Sweden. This selection is based on two types of area:

- Areas categorised as important bird areas (IBA), by Birdlife International
- The migratory paths of large quantities of birds during spring and autumn.

Some are already protected as nature reserves and are consequently covered by exceptions according to group 1 in the criteria. Coastal regions with especially large quantities of migratory sea-birds are parts of the west coast, Falsterbo, southeast Blekinge, Kalmar sound, Öland's east coast, Gotland's east coast, eastern Uppland and Holmöarna. The list is regularly updated.

Important migratory paths

- Björn's archipelago, Uppland
- Gräsö archipelago and Örskär, Uppland
- Parts of the Gotland coast, bird sanctuaries, nature reserves and Ramsar areas.
- Parts of the Öland coast, bird sanctuaries, nature reserves and Ramsar areas.

Important bird resting places

- Björn's archipelago, Uppland
- Stockholm's outer archipelago
- Sankt Anna archipelago, Östergötland
- Parts of the Gotland coast, bird sanctuaries and nature reserves
- Parts of the Öland coast, bird sanctuaries and nature reserves
- Northeast Skåna coast
- Stigfjorden, Västergötland
- Torslandaviken, Västergötland
- Kungsbackafjorden, Västergötland

- Båtafjorden, Halland
- Skälderviken, Skåne
- Kilsviken, Värmland

Large breeding colonies of sea-birds:

- Skvolpen, Norrbotten
- Bonden, Västerbotten
- Gnäggen, Västerbotten
- Danskär-Örskär, Östergötland

Migration paths for large quantities birds during spring and autumn:

- Bjuröklubb, Västerbotten
- Korsholmsudden, Hälsingland
- Skatön, Hälsingland
- Storjungfrun, Hälsingland
- Eggegrund, Gästrikland
- Inner part of Gävlebukten, Gästrikland
- Öregrundsgrepen
- Skatudden, Uppland
- Rönnskärs udde, Uppland
- Skaten, Uppland
- Horsten, Uppland
- Söderarm, Uppland
- Huvudskär, Sörmland
- Landsort, Sörmland
- Häradsö, Östergötland
- Hartsö-Enskär, Östergötland
- Hoburgs bank, Gotland
- Norra Midsjöbanken
- Kalmarsund, the whole stretch closest to the Öland coast
- Hanö, Blekinge
- Coastal region Simishamn – Kåseberga, Skåne
- Höllviken, Skåne
- Coastal region Torekov-Båstad-Mellbystrand-Kullaberg, Skåne/Halland
- Glommen, Halland
- Nidingen, Halland
- Hönö's west side, Västergötland
- Väderöarna, Bohuslän
- Ramvikslandet – Sotenäs, Bohuslän
- Malön, Halland
- Tistlarna, Västergötland
- Vinga, Västergötland
- Koster, Bohuslän
- Lilla Middelgrund, Halland
- Värmlandsnäs, northwest part of Vänern lake, Värmland
- Vänern lake east coastline, Värmland/Västergötland

Appendix 3 Environmental fund projects for hydroelectric power

Allocation to the environmental fund for hydroelectric power level I

Companies selling eco-labelled electricity based on hydroelectric power shall allocate money to their own environmental fund or a fund managed by the SSNC. The sum to be allocated is set by the SSNC in accordance to the sold volumes and the Good Environmental Coice criteria. This does not apply to licence holders that buy electricity that is already Good Environmental Choice labelled.

The fund's resources shall be used to reduce the environmental impact of hydroelectric power. A company applying for the Good Environmental Choice labelling of its products shall report the measures it intends to carry out. The list below describes examples of approved measures. Other proposals can be approved after special testing by the SSNC.

The measures need not be applied to the hydroelectric plants that produce Good Environmental Choice labelled energy or be carried out in connection with a specific hydroelectric plant. Work shall begin within six months of the company receiving its licence. The result shall be reported in the audit and the final account rendered when the measure has been completed.

Approved projects that can be financed by the Environmental fund

- Environmental report in accordance with the SSNC guidelines for environmental reports.
- Measures that result in the biological diversity in forests or wetlands at river basins being maintained or restored.
- Changes in a dam's tapping points enabling, in the first place, the tapping of water close to the surface.
- Changes in regulating to reduce harm to biological diversity or the natural environment as a whole. Examples of measures are changes in regulating which restore a more natural water level variation and flow and which cause high spring water levels so as to maintain natural riverside vegetation. Even increased minimum withdrawal, over and above the mean low discharge (MLQ), can be included as a measure.
- Measures that contribute to the restoration of continuity in rivers such as fish runs. Measures that benefit more than a single species.
- Removal of migration obstacles for fish and other water based organisms in streams joining the river.
- Projects aimed at preserving listed species endangered because of hydroelectric plants in environments in or close to the river.
- Allocation of fall-rights as a nature conservation area.
- Demolition of existing dams or other structures in the river that belong to the hydroelectric plant.
- Financing of appropriate research for the purpose of increasing knowledge of how the environmental impact caused by hydroelectric power can be reduced.

Other measures can be approved after special testing by the SSNC. The list is regularly updated.

Appendix 4 Energy efficiency

Companies supplying Good Environmental Choice labelled electricity shall allocate resources amounting to 500 SEK/GWh for improving energy efficiency in their own fund or a fund managed by the SSNC. The resources that shall be allocated in the energy efficiency improvement fund shall either be placed in the company's own account or the SSNC central energy efficiency fund. If the resources are placed in the company's own fund, this money shall be kept separate from other investment capital in the company. The investment fund money can be used for the part financing of an extensive project. In this case it shall be made clear which part of the project is financed by money from the fund.

This does not apply to electricity suppliers that buy electricity that is already Good Environmental Choice labelled from another licence holder. The fund resources shall be used for measures that can be quantified in the form of saved electricity. A company applying for Good Environmental Choice labelling for its products shall report the measures it intends to carry out, the predicted energy saving and the organisation holding responsibility.

Work shall begin within six months of the company receiving the licence but can continue longer than the current financial year. The result shall be reported in the audit, and the final account rendered when the measure has been completed. Energy efficiency projects shall aim at reducing electricity use. An assessment of how and where the electricity is used, divided into heat, light, ventilation, the process and other shall be included in the application. Considerable attention is paid to projects incorporating new technology which has large effectiveness improvement potential.

Approved projects that can be financed through the Energy effectiveness improvement fund.

- Energy efficiency within its own operations outside the requirements of legislation or permits.
- Energy efficiency shall be aimed at reducing electricity use in premises, industry or housing.
- Projects that reduce electricity consumption for lighting without decreasing the amount of light or worsening working/living conditions.
- Projects that reduce electricity consumption in pneumatic systems.
- Projects that reduce electricity consumption in pumps, motors and fans while maintaining their performance.
- Projects that reduce electricity consumption in white goods and office equipment.
- Projects that reduce electricity consumption in ventilation systems without worsening indoor environments.
- Projects that reduce electricity consumption by cutting idling consumption. This can also include routines and other ways of bringing about permanent change in a behaviour pattern which are aimed at reducing electricity consumption.
- Projects that reduce electricity consumption in electric heating systems through insulation, control or solar power systems.
- Projects that reduce electricity consumption in air conditioning systems without worsening the performance of the system, for example, through sun screening.
- Projects that reduce electricity consumption through small scale electricity production using solar cells.

The project owner must be able to show that the energy efficiency is a result of the measure. The measures shall be documented and could be used as good examples to show to other parties.

The project owner must be prepared to receive study visits and provide interested parties with relevant information.

Appendix 5 Investment fund

Companies that supply Good Environmental Choice labelled electricity can take advantage of an investment fund for renewable energy in order to satisfy the eco-labelling requirements for additionality. The type of production that the investment fund can be used for shall be such that it is unlikely that electricity certificate fees or other support structure together with the electricity price will cover the variable production costs. The investment fund can also be used for demonstration and development projects concerning new renewable source technology.

The money that shall be placed in the investment fund shall either be placed in the company's own account or the SSNC central investment fund. If the resources are placed in its own fund, this money shall be kept separate from other investment capital in the company. The investment fund money can be used for the part financing of an extensive project. In this case it shall be made clear which part of the project is financed with money from the fund.

Companies applying for electricity Good Environmental Choice labelling where investment funds are involved shall report the projects they intend to carry out using investment fund financing.



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The Swedish Society for Nature Conservation is a non-profit organisation with the power to bring about change. We spread knowledge, chart threats to the environment and create solutions, as well as lobby politicians and agencies at both national and international levels.

The society has around 170,000 members and is represented by local groups and county associations throughout the country.

We are behind the world's toughest environmental label,
Good Environmental Choice.

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Bra Miljöval

Appendix 6: Ecocycle Councils Guidelines



**The Ecocycle Council's guidelines
on waste handling in construction
and demolition works**



Why guidelines?

The answer is simple! The use of the guidelines will raise the level of quality and create uniformity in the handling of construction and demolition waste. If all involved in the construction sector – property owners, consultants and contractors – follow the guidelines, the correct handling of waste will soon become routine. Knowledge will be carried from building project to building project and from company to company. The same routines and the same working procedures all along the line.

The Ecocycle Council's guidelines specify the manner in which the entire construction sector is to work with the handling of waste from construction and works.

Who benefits from using the guidelines?

Everyone in the production chain – both builders and property owners! From the personnel at the site to those working at the office. The guidelines contain both instructions and aids for waste handling which are to become standard practices in the construction sector.

Building or demolition?

Both! The guidelines establish requirements and provide aids for both procedures. From the preliminary taking of an inventory, via the preparation of a waste handling plan to rules for sorting at source of hazardous waste, electrical scrap and other waste.

Office staff are helped to negotiate for both the inventory-taking and the contracting for the work by using texts in Administrative Instructions according to AF Konsult and AF AMA.

At the site, help is provided by means of waste lists and rules for colour-coding on containers for different waste fractions sorted at source. Simple, well-considered and standardised throughout the construction industry.

What is to be placed where?

The guidelines prescribe a base level for sorting at source and waste lists indicate how different kinds of waste are to be handled.

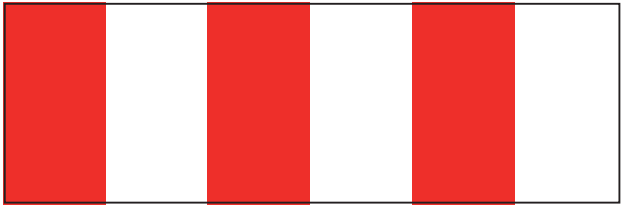
On the web?

Certainly! The guidelines with their instructions for negotiating and all waste lists, AF-texts and other aids are freely available at www.kretsloppsradet.com.

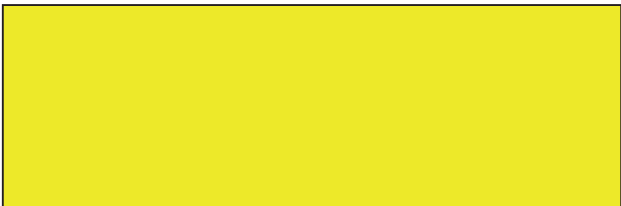
Waste fractions



Hazardous waste



Electrical scrap



Wood



Plastics for recycling



Combustible



Gypsum



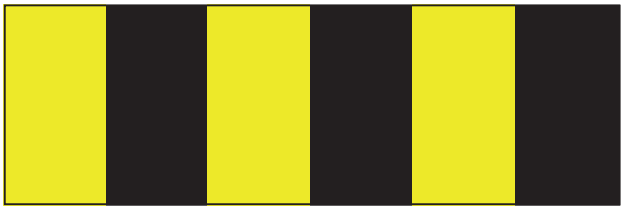
Scrap and metal



Inert landfill material



Landfill (separated)



Mixed waste to be sorted

The Ecocycle Council's guidelines specify the manner in which the construction industry and property owners are to handle waste from construction and demolition operations. The guidelines are an interpretation of the relevant legislation on the basis of the intentions of the environmental programme.

The guidelines recommend:

- A base level for sorting at source, with designations of the main fractions, is to be used in common by all parties involved, each fraction having its particular colour code.
- The volumes of waste in the categories landfill or mixed waste to be sorted are to be minimized.
- Hazardous wastes and electrical scrap are to be handled separately and in a safe manner. (This is a legal requirement)
- Before all types of demolition work are begun, an inventory is to be taken and information about hazardous waste is to be registered in a waste-handling plan.
- A waste-handling plan is to be prepared for each construction and demolition project.
- Those performing the inventory, the performance of their work and the registration of the inventory are to satisfy specific requirements.
- The negotiations regarding waste handling by contractors are to be in accordance with specific requirements.
- The Contractor/Property owner ordering the work is to monitor the performance of waste-handling.
- For guidance, lists of waste categories are available in Swedish at www.kretsloppsradet.com.

The Ecocycle Council is an association of around 30 organizations within the Swedish building and real estate sector. The aim of the organization is “that the building sector, through voluntary efforts, on market grounds and in close co-operation with authorities and legislation, succeeds in conducting credible, effective, coordinated and systematic environmental work that results in permanent environmental improvements”.

Appendix 7: Comparison between US and Swedish Air Quality Standards

LEED 2012 – additional information

EQ Credit Enhanced Indoor Air Quality Strategies

Outdoor Air Pollutants

U.S. National Ambient Air Quality Standards <http://www.epa.gov/air/criteria.html>

Swedish Miljökvalitetsnormer för utomhusluft <http://www.naturvardsverket.se/sv/Start/Lagar-och-styrning/Miljokvalitetsnormer/Utomhusluft-miljokvalitetsnormer/>

Pollutant	U.S. Level	U.S averaging time	Sweden Level	Sweden averaging time
Carbon monoxide	9 ppm 10 mg/m ³	8-hour	10 mg/m ³	8-hour/24-hour
	35 ppm 40 mg/m ³	1-hour		
Particulate matter PM10	150 µg/m ³	24-hour	50 µg/m ³	24-hours
			40 µg/m ³	1-year
Particulate matter PM2.5	15 µg/m ³	1-year	25 µg/m ³	1-year
Ozone	0.075 ppm	8-hour	120 µg/m ³ ~ 0.060 ppm	8-hour
	0.12 ppm	1-hour		
Nitrogen dioxide	53 ppb	1-year	90 µg/m ³	1-hour
	100 ppb	1-hour	60 µg/m ³	24-hour
			40 µg/m ³	1-year
Sulfur dioxide	75 ppb	1-hour	200 µg/m ³	1-hour
			100 µg/m ³	24-hour
Lead	0.15 µg/m ³	Rolling 3-month	0.5 µg/m ³	1-year
Benzene	---	---	5 µg/m ³	1-year
Benzo(a)pyrene	---	----	1 ng/m ³	1-year

Other air contaminants – Specified using occupational exposure limits

The compounds must be treated individually.

U.S.

Occupational Safety and Health Administration (OSHA) – Permissible Exposure Limits (PELs)
<http://www.osha.gov/SLTC/pel/>. OSHA Standard number 1910.1000, titel: Air contaminants.
 Accessible on the internet.

American Council of Governmental Industrial Hygienists (ACGIH) – Threshold Limit Values (TLVs)
<http://www.acgih.org/TLV>. Downloadable products can only be purchased in single quantities
 (approx. \$60 per compound).

National institute of Occupational Safety and Health (NIOSH) – Recommended Exposure Limits (RELs) <http://www.cdc.gov/niosh/docs/2005-149/pdfs/2005-149.pdf>. The whole document is on the internet as a pdf-file.

Sweden

Arbetsmiljöverkets Författningssamling AFS 2005:17: Hygieniska gränsvärden och åtgärder mot luftföroreningar), http://www.av.se/lagochratt/afs/afs2005_17.aspx. The document can be downloade from the internet.

Appendix 8: Filter Equivalencies EU-MERV

FILTER EFFICIENCY SELECTION

(1) Arrestance	(1) Efficiency	(2) MERV Rating	(3) European Efficiency Class	Filter Type	Airguard Product Selection
60 - 80%	Less Than 20%	MERV 1 - 4	G1, G2	Disposable Panel Filters Permanent Metal Filters Fiberglass Media Latex Coated Natural Fiber Media Foam Media Automatic Roll Filter Media	Facet™ Disposables Types HS, HD Standard Grade Permalast® Foam Media Types CF, DSF
80 - 90%	Less Than 20%	MERV 5	G3	Disposable Panel Filters Ring Panel Filters Synthetic Media Automatic Roll Filter Media	Tri-Plex 85® Series N, Series 55, Bio-Pure® StreamLine™ Polyester Media Types YTS, SHP, DMC, DL-1, DL-2
90 - 95%	20 - 30%	MERV 6	G4	Cube Filters Self-Supported Pocket Filters	Uni-Cube™ VA-420
90 - 95%	25 - 30%	MERV 6 - 7	G4	Ring Panel Filters Pleated Panel Filters Cube Filters	TRI-90® (MERV-8) DP-40®, DP-40 Max, DPGT, SC, DP4-SA Bio-Pure Tri-Ply®
95%	30 - 40%	MERV 7 - 8	G4	Self-Supported Pocket Filters Pleated Panel Filters	VA-440, SynPak DP 8 (MERV-8) PowerGuard™ (MERV-11), DP Class 1, DPHT
95 - 98%	40 - 50%	MERV 8 - 9	F5	Extended Surface Pocket Filters	Venti-Pak® V-4, Clean-Pak™ CP-4
98%	50 - 60%	MERV 9 - 10	F5	Extended Surface Pocket Filters Extended Surface Rigid Cell Filters	Venti-Pak V-5, Clean-Pak CP-5 Vari-Pak, Vari-Pak Model S
99%	60 - 70%	MERV 10 - 11	F6	Extended Surface Pocket Filters Extended Surface Rigid Cell Filters	Clean-Pak CP-6, Venti-Pak V-6 Bio-Pure Variflow®, Variflow SC, Variflow Compact Series, Variflow II, Variflow II-M, Variflow II-MC, Vari+Plus®, Vari-Pak®, Vari-Pak Model S, Bio-Pure
99%	70 - 80%	MERV 12 - 13	F6	Extended Surface Pocket Filters	Multi-Guard® MG-7
99%	80 - 90%	MERV 13 - 14	F7	Extended Surface Pocket Filters Extended Surface Rigid Cell Filters	Clean-Pak CP-8, Venti-Pak V-8 Multi-Guard MG-8, Bio-Pure Variflow, Variflow SC, Variflow Compact Series, Variflow II, Vari+Plus, Vari-Pak, Vari-Pak Model S, Bio-Pure
99%	90 - 95%	MERV 14 - 15	F8	Extended Surface Pocket Filters Extended Surface Rigid Cell Filters	Clean-Pak CP-9, Multi-Guard MG-9 Venti-Pak V-9, Bio-Pure Variflow, Variflow SC, Variflow Compact Series, Variflow II, Variflow II-M, Variflow II-MC, Vari+Plus, Vari-Pak, Vari-Pak Model S, Bio-Pure
NA	95% DOP	MERV 16	H11	Extended Surface Rigid Cell Filters	Microguard® 95
NA	99.97% 99.99% 99.999% 99.9995%	NA	U13-14 U15	HEPA/ULPA Filters	Microguard 99, MicroPleat™

(1) Arrestance and Dust Spot Efficiency ratings are based on the ASHRAE 52.1 - 1992 test method.
 (2) Minimum Efficiency Reporting Value (MERV) ratings are based on the ASHRAE 52.2 test method.
 (3) European Efficiency Classes are based on European Standards EN 779 and EN 1882.



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Airguard has a policy of continuous product research and development and reserves the right to change design and specifications without notice.

Appendix 9: Swedish Lighting Standards

SS-EN 12464-1 Light and lighting – lighting of workplaces – Part 1: indoor workplaces

This European Standard specifies lighting requirements for indoor work places, which meet the needs for visual comfort and performance. All usual visual tasks are considered, including Display Screen Equipment (DSE). This European Standard does not specify lighting requirements with respect to the safety and health of workers at work and has not been prepared in the field of application of Article 137 of the EC treaty, although the lighting requirements, as specified in this standard, usually fulfill safety needs. Lighting requirements with respect to the safety and health of workers at work may be contained in Directives based on Article 137 of the EC treaty, in national legislation of member states implementing these directives or in other national legislation of member states. This standard neither provides specific solutions, nor restricts the designers freedom from exploring new techniques nor restricts the use of innovative equipment. This standard is not applicable for the lighting of outdoor work places and underground mining.

SS-EN 15193 Energy performance of buildings - energy requirements for lighting

This European Standard specifies the calculation methodology for the evaluation of the amount of energy used for indoor lighting inside the building and provides a numeric indicator for lighting energy requirements used for certification purposes. This European Standard can be used for existing buildings and for the design of new or renovated buildings. It also provides reference schemes to base the targets for energy allocated for lighting usage. This European Standard also provides a methodology for the calculation of instantaneous lighting energy use for the estimation of the total energy performance of the building. Parasitic powers not included in the luminaire are excluded. In this European Standard, the buildings are classified in the following categories: offices, education buildings, hospitals, hotels, restaurants, sports facilities, wholesale and retail services and manufacturing factories. In some locations outside lighting may be fed with power from the building. This lighting may be used for illumination of the façade, open-air car park lighting, security lighting, garden lighting etc. These lighting systems may consume significant energy and if they are fed from the building, this load will not be included in the Lighting Energy Numeric Indicator or into the values used for heating and cooling load estimate. If metering of the lighting load is employed, these loads may be included in the measured lighting energy.